

# **TOWARD WILDLIFE-FRIENDLY WIND POWER: A FOCUS ON THE GREAT LAKES BASIN**

**Hilton Toledo and Dana Conference Center, Toledo, Ohio  
Lucas Auditorium  
June 27-29, 2006**

**Conference Notes: Wednesday, June 28, 2006**

**Erickson presentation**

**Gehring presentation**

**Larkin presentation**

**Gauthreaux presentation**

**Kunz presentation**

(comment from audience): actually cheaper now to send tissue sample to lab for analysis if you have a deteriorated specimen, rather than try to send to museum expert for visual ID

**Barclay presentation**

**Evans presentation**

**Walls presentation**

**Merritt (for Kelly) presentation**

**Smith presentation**

**Redell presentation**

**Speaker panel—Q & A**

Q: What do bat detectors tell us about population vs. activity?

A: (Barclay): Good question. Can't equate number of passes to number of bats. Some clues—more likely that 10 passes are 10 individuals during migration time (vs. foraging), but we still don't know for sure.

Q: What are the most meaningful technologies for post-construction monitoring?

A: (Gauthreaux): Far less emphasis on post-construction in permitting process now. But methodologies from pre-construction can be applied to post-construction. Main disconnect is lack of data linking exposure to mortality... currently, we have to build the structures first in order to really know mortality

Q: Can you give more detail about mortality at prairie sites?

A: (Barclay): Other prairie sites did have uniformly low mortality. Not sure why that one prairie site was so high. No distinguishing landscape feature... not sure what sets it apart... maybe higher turbines? Key point: can't always say that prairie sites will be low

Q: Is 2 yrs of pre-construction monitoring a DEFRA requirement? Details?

A: (Walls): what's expected from the guidance. Not regulatory. Kind of fuzzy. But main idea is they want to see that you've followed the guidance.

Q: What's the process in the UK if you do find problem in post-construction monitoring?

A: (Walls): haven't gotten that far in UK. But something would be done, given how birds are regarded highly in UK. But yes, conditions in agreements—agree that action would be taken if something like this comes up.

Q: What's the status of the Norway issue?

A: (Walls): Particularly bad on one island. Norwegians trying to deal with it now. We'll use the data in the UK, and keep sea eagles in mind.

Q: In UK, any push to have less than 2 yrs pre-construction monitoring?

A: (Walls): mention tern evidence... clear that behavior can vary 1 yr to the next. biologists all recognize the potential for this variation, and the need for multi-yr monitoring

Q: Re: stable isotopes—what about influence of changes in bats' diet?

A: (Kunz): Work hasn't really progressed to that stage. So far we just have the general correlation between hair and location.

(audience comment): much work on isotopes in birds too

Q: What about bats below turbines that look uninjured? Maybe they were caught in air backwash?

A: (Barclay): most do have obvious injuries. But yes, a few with no obvious injuries. didn't do necropsies to look for internal injuries. Some large bats (e.g., hoary) may get stuck on ground... caught between crops, can't get speed up to go back aloft. No indication of bats in backwash though.

(Kunz): One hypothesis: decompression/debilitation

(Arnett): Thinks about 35% of Mountaineer samples had no obvious injuries. >40% at Meyersdale. Didn't do necropsies. But also found 9 to 11 alive and stuck on ground (they released these at night). Many bats also struck, then fell down with crippling injury (but not dead on impact... just died on the ground). German report did look at blood vessel bursting, decompression.

(Barclay): If bat hits slower part of blade, it may just have concussion, fall to ground alive. But if can't get off of ground, then it ends up dead.

(Kunz) Thermal observations show almost 70% of hits occurred near middle of turbine (near hub). So confirm this idea that many impacts are in middle (slower) area

(Erickson) We do have one observation of bat stuck to blade near tip. But otherwise, also see a lot of hits near middle.

Q: How would you design a study to see how birds and bats use 3-D airspace?

A: (Kunz): 3-D requires more than a single camera. At Mountaineer, used 3 cameras. One problem: lens width. Some cameras better than others. Can get better resolution and wider lens, but costs a lot of money. FLIR cameras they used are \$85K. Next level up (Merlin camera) is \$120K. Phoenix model is ~\$180K. As for survey design, need to address variability. Not all turbines are alike. 3-D is doable, just realize it's also expensive.

(Erickson): Right places to do research are existing turbines where you do have high mortality, so you have good sample size.

Q: Any experience with behavior of birds who seem to have lost horizontal and vertical visibility? In a fog?

A: (Walls): not much good info because often don't have observers there at those times, and these times are so rare. But we have seen geese over-fly roost sites, calling to try to figure out where they are, flying wrong direction. Also have info about how weather forces migratory birds down to lower altitudes.

Q: How would you sample, considering that there may just be one day with peak migration? Other one-day weather events?

A: (Erickson): existing radar studies done nightly, show high variation. Post-construction mortality studies: may not be at every turbine every day, but may be somewhere on site just about every day.

Q: Why don't we use non-parametric statistics to describe nature?

A: (Erickson): We commonly use mean and range to describe the data. Often report number of bats found at each turbine though... so we can see whether it's the turbine that's not moving, etc.

Q: Can we ask better questions to focus money on the right study priorities? Focus on what the resource agency really needs pre-construction?

A: (Gautreaux): Regulators generally don't have the money to fund studies. Investors don't want to fund studies. The questions are great; it's just a cash flow problem. Even at NSF, which does have money, only 7% of animal behavior proposals are funded.

(Walls): Developers are the same in the UK—they don't want to spend money on studies either. But because there's a framework, those who wrote the framework can see the product of the study, comment on it, and hold up the project if study is insufficient. So there's financial incentive to follow guidance. COWRIE model successful too, because the Queen owns the offshore property and can require lease payment into study fund

(Larkin): Suggest basic rule: no study should be done with just one method. Require all studies have multiple methods, for confirmation, validation, etc.

(Barclay): Need our questions to link together to try to predict risk. Try to develop models based on collective data, so we can at least categorize sites (high vs. low risk) without totally reinventing wheel each time. Maybe can find a way so don't have to specifically assess every aspect of every site.

(Evans): In New York, with energy deregulation, research is piecemeal. So even though lots of money spent, it's not coordinated. Helpful to have cooperation, meetings, groups working to use money more efficiently.

(Kunz): No money to study cumulative impacts. All funding is local thus far, yet cumulative impacts are critical... really need central body of funding.

Q: In hydro industry, there are analogous issues of entrainment, etc. They struggled with developing guidance for sonar and netting studies. Is there an industry standard providing basic consistency in data from radar, etc.? If so, are these standards adhered to? If not, would there be a benefit to developing such standards?

A: (Larkin): All of today's talks listed citations for calibration, etc. Key is to rely on peer-reviewed sources like this.

(Walls): No standardized guidance in UK. But yes, working on this European-wide. Which radar bands to use, etc...

(Erickson): National wind group (???) working on nocturnal monitoring guidance

Q: Any monitoring of large mammal use post-construction?

A: (Erickson): Some studies in Wyoming. Not much overall though.

Q: We spend lots of time finding problem. What can we do to alleviate the problems once construction is done?

A: (Barclay): First, need to know if it is a problem (issue of significance thresholds). Hard to move turbines or totally shut down. But operational things can be done, like shutting down at certain times. Pre-construction, it's a siting issue, but we don't really have a good way to deal with that yet.

**Rackstraw presentation**

**Allan presentation**

**Francis presentation**

**Boysen presentation**

**Additional brief presentations**